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دليل وصف البرنامج الأكاديمي والمقرر

2024

:the introduction

The educational program is considered a coordinated and organized package of academic courses that include procedures and experiences organized in the form of academic vocabulary, the main purpose of which is to build and refine the skills of graduates, making them qualified to meet the requirements of the labor market. It is reviewed and evaluated annually through internal or external audit procedures and programs such as the .external examiner program

The description of the academic program provides a brief summary of the main features of the program and its courses, indicating the skills that students are working to acquire based on the objectives of the academic program. The importance of this description is evident because it represents the cornerstone of obtaining program accreditation, and the teaching staff participates in writing it under the supervision of the scientific .committees in the scientific departments

This guide, in its second edition, includes a description of the academic program after updating the vocabulary and paragraphs of the previous ,guide in light of the latest developments in the educational system in Iraq which included a description of the academic program in its traditional form (annual, quarterly), in addition to adopting the description of the academic ,program circulated according to the book of the Department of Studies T.M.3 /3. 2906 on 5/3/2023 regarding programs that adopt the Bologna .Process as a basis for their work

In this area, we can only emphasize the importance of writing descriptions of academic programs and courses to ensure the smooth conduct of the educational process.

Concepts and terminology:

Description of the academic program : The description of the academic program provides a concise summary of its vision, mission, and goals, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description : Provides a necessary summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he or she has made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be a developed, inspiring, motivating, realistic and applicable programme.

Program message: It briefly explains the objectives and activities necessary to achieve them, and also identifies the program's development paths and directions.

Program objectives: These are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum structure: All courses/study subjects included in the academic program according to the approved learning system (semester, annual, Bologna track), whether it is a requirement (ministry, university, college, or scientific department) along with the number of study units.

Learning outcomes: A consistent set of knowledge, skills, and values that the student has acquired after the successful completion of the academic program. The learning outcomes for each course must be determined in a way that achieves the program objectives.

and learning strategies : They are the strategies used by a faculty member to develop student teaching and learning, and they are plans that are followed to reach learning goals. That is, it describes all classroom activities and extracurricular to achieve the learning outcomes of the programme.

form Academic program description

University name: Diyala University

College/Institute: College of Science

Scientific Department: Department of Biotechnology

Name of the academic or professional program: Bachelor's degree

Name of final degree: Bachelor of Biotechnology

Study system: semester and Bologna track system

Description preparation date: 1/5/2024

Date of filling the file: 1/5/2024

التوقيع :

اسم رئيس القسم: أ.م.د رياض حميد نصيف

التاريخ :

التوقيع :

اسم المعاون العلمي:أ.د منذر حمزة راضي

التاريخ :

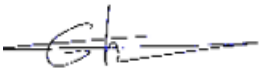
Check the file before

Division of Quality Assurance and University Performance

Name of the Director of the Quality Assurance and University

: Performance Division

the date



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Authentication of the Dean

Prof. Dr. Taha Muhammad Hassan

١. See the program

Working according to a solid program that achieves leadership and excellence in the academic and research field, taking into account national and international .quality standards and academic accreditation

٢. Program message

The Department of Life Sciences is committed to providing specialized programs that meet national needs, including qualifying students with the skills and .knowledge necessary for the requirements and needs of society

Commitment to national and international quality standards in preparing competent graduates capable of academic and research work and meeting the .requirements of the labor market

The department seeks to improve and develop program quality standards to keep pace with the continuous changes in community needs through periodic .review of the department's plan, goals, and mission

٣. Program Goals

Providing the labor market with graduates with a high level of scientific and .practical competence

Developing scientific and academic research capabilities and encouraging .innovation for teachers and students

Transferring the cognitive skills of teachers, researchers and graduates to .society

Achieving advanced ranks in academic classifications locally, regionally and .globally

Communicating with leading local and international academic and research bodies to achieve the maximum possible benefit by forming joint research teams and benefiting from accumulated experience and research capabilities for .scientific advancement

٤. Program accreditation

٥. Other external influences
both

٦. Program structure				
Program structure	Number of courses	Study unit	percentage	* comments
Enterprise requirements	4	9	7.4%	
College requirements	6	35	28.9%	
Department requirements	38	121	100%	
summer training	1	Satisfied		
Other				

* Notes may include whether the course is core or elective.

٧. Program description				
Year/level	Course or course code	Name of the course or course	Credit hours	
		General biology	٢	٢
The first / the first		Analytical chemistry	٢	٢
		human rights		٢
		Arabic language		٢

٢		Computer science		
٢	٢	Principles of biotechnology		First/second
	٢	My life stats		
٢	٢	organic chemistry		
	٢	English language		
٢	٢	Life physics		
٢	٢	General microbiology		Second/first
٢	٢	Principles of genetics		
٢	٢	Environmental life technologies		
٢	٢	Animal physiology		
٢	٢	Cell life		
	٢	Baath Party crimes		
٢	٢	Medical microbiology		Second/second
٢	٢	Phosphorus is a plant		
٢	٢	Animal histology		
٢	٢	Biosafety and risk management		
٢	٢	Microbiology physiology		
		Biochemistry 2		
٢	٢	Food microbiology		Third/first
٢	٢	Animal tissue culture		

٢	٢	mushrooms		
٢	٢	Molecular techniques		
٢	٢	Viruses and vaccines		
٢	٢	Antibiotics		Third/second
٢	٢	Design of experiments		
٢	٢	Cellular genetics		
٢	٢	Microbiology genetics		
٢	٢	immunity		
٢	٢	Bioinformatics		Fourth/first
٢	٢	Medicinal mushrooms		
٢	٢	Enzymes		
٢	٢	Immunological genetics		
٢	٢	Industrial microbiology		
٢	٢	Plant tissue culture		Fourth/second
٢	٢	toxicology		
٢	٢	Satisfactory analyzes		
٢	٢	Plant chemistry		
٢	٢	Genetic Engineering		
		Research project		

Expected learning outcomes of the programme .٨
Knowledge

Learning outcomes 1	Satisfied
Skills	
Learning outcomes 2	Satisfied
Learning outcomes 3	Satisfied
Value	
Learning outcomes 4	Satisfied
Learning outcomes 5	Satisfied

٩. Teaching and learning strategies

.Theoretical lectures according to the approved curriculum

.Quizzes and brainstorming after the lecture

.Conduct scientific discussions in class

.Submitting scientific reports on the subject area during the semester

.Stimulating knowledge exchange among students

١٠. Evaluation methods

,This is done by testing students theoretically, practically, and orally (seminars)

.classroom activities, and more Safia, scientific reports

Motivating the student by encouraging the free generation of ideas, accepting

.them, and training him in the skill of brainstorming

١١. education institution

Faculty members

Scientific rank	Specialization		Special requirements/skills (if (any		Preparing the teaching staff	
	general	private			angel	lecturer
Assistant Professor						

						Assistant Professor
						Assistant Professor
						Assistant Professor
						Assistant Professor

Professional development
Orienting new faculty members
The new faculty member's familiarity with the university, its development vision, its plan towards internationalization, and its development programmes.
Helping the new faculty member adapt practically and psychologically and alleviating anxiety that could hinder his participation and integration into university work and activities.
Providing the opportunity for the new faculty member to build a network of relationships and communicate with his peers from other departments and colleges.
The new faculty member's familiarity with his rights and duties (administrative and legal).
Developing the faculty member's skills in teaching, learning, and managing the educational process.
Professional development for faculty members
▪ Technical development and its implications on the educational process in terms of employing information and communication technology and learning and teaching techniques.
▪ Institutional development, which includes development planned and supervised by a specialized unit at the university , which can employ ongoing training courses, workshops, discussion panels, hosting visiting professors, and exchanging visits and research contributions .
▪ Holding continuing education courses on teaching methods, developments in them, and keeping pace with them.
▪ Self-development to acquire psychological and cognitive skills.
▪ Continuous improvement and development of faculty members through training programs and workshops inside and outside the department, university and country.
Encouraging faculty members to obtain the highest academic and administrative ranks through promotions.

١٢. **Acceptance standard**

The Life Sciences Department is subject to the work mechanism of the Ministry of Higher Education and Scientific Research/Central Admissions Department, where graduates of preparatory school (scientific branch) are nominated for admission to the department based on their graduation rates.

١٣. **The most important sources of information about the program**
The curriculum approved by the Ministry of Higher Education and Scientific Research and its guidelines. Decisions and recommendations of scientific committees in the department and university. Courses in developmental teaching methods. SSR self-evaluation report for previous years. Description of courses. Conferences, seminars, workshops and panel discussions. State institutions related to the department's specializations. Graduates Unit. Searches in global databases for similar experiences. Personal experiences.

١٤. Program development plan
Modernizing study plans and scientific curricula by keeping pace with global developments and using modern sources to keep pace with the labor market, as well as modernizing, developing and diversifying learning and teaching methods.

Program skills chart

Learning outcomes required from the programme														
Value				Skills				Knowledge				Essential or ?optional	Course Name	Course Code	Year/level
C4	C3	C2	C1	B4	B3	B2	B ١	A4	A3	A2	A1				
√	√	√	√	√	√	√	√	√	√	√	√	Basic	General biology		the first
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Analytical chemistry		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	human rights		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Arabic language		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Computer science		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Principles of biotechnology		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	My life stats		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	organic chemistry		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	English language		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Life physics		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	General microbiology		the second
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Principles of genetics		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Environmental life technologies		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Animal physiology		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Cell life		

√	√	√	√	√	√	√	√	√	√	√	√	Basic	Baath Party crimes		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Medical microbiology		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Phosphorus is a plant		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Animal histology		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Biosafety and risk management		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Microbiology physiology		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Biochemistry 2		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Food microbiology		Third
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Animal tissue culture		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	mushrooms		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Molecular techniques		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Viruses and vaccines		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Antibiotics		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Design of experiments		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Cellular genetics		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Microbiology genetics		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	immunity		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Bioinformatics		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Medicinal mushrooms		

√	√	√	√	√	√	√	√	√	√	√	√	Basic	Enzymes		Fourth
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Immunological genetics		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Industrial microbiology		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Plant tissue culture		
√	√	√	√	√	√	√	√	√	√	√	√	my choice	toxicology		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Satisfactory analyzes		
√	√	√	√	√	√	√	√	√	√	√	√	my choice	Plant chemistry		
√	√	√	√	√	√	√	√	√	√	√	√	my choice	Genetic Engineering		
√	√	√	√	√	√	√	√	√	√	√	√	Basic	Research project		

first stage

The decision.١	
Analytical chemistry	
Course code .٢	
Season/ year .٣	
Semester system / 2023-2024	
The date this description was prepared .٤	
٢٠٢٤/٢٤/٤	
A Available forms of attendance.٥	
Is mandatory	
Number of study hours (total)/number of units (total) .٦	
per week (2 hours theoretical part + 2 hours practical part) / number of units = 3 ٤	
Name of the course administrator .٧	
Name: M. M. Muhammad Jabbar Muhammad . : Email mohammedjabbar0908@gmail.com	
objectives Course .١	
:The graduate must be able to know and understand all of the following **To develop an understanding of the scope and uses of analytical methods . ١ .in chemistry** **Establish an appreciation for the role of chemistry in quantitative analysis .٢** **To develop an understanding of the broad role of the chemist in .٣ .Measurement and problem solving for analytical tasks**	**jectives of the study subject**

٤. Provide an understanding of the chemical methods used for racism and complex analysis. **٥. Providing experience in some of the scientific methods used in analysis chemistry.** **٦. To develop some understanding of occupational and safety Assessor responsibilities in working on chemical analysis.**	

٢. Teaching and learning strategies

The main strategy that will be adopted in achieving this The unit aims to encourage students' participation in exercises while they are at At the same time improving and expanding their critical thinking skills. this will be **It is achieved through classroom, interactive educational programs and by looking at types Simple experiments involve some sampling activities of interest the students.**	**The strategy**

٣. Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	+ PowerPoint availability of materials for this	Introduction to analytical chemistry	Definition of analytical chemistry	٢n + 2p	the first
Daily exams	+ PowerPoint availability of materials for this	Solutions and classification of solutions	The concept of solutions	٢n + 2p	the second
Daily exams	+ PowerPoint availability of materials for this	Express concentrations of solutions	Expressing the concentration of the solution	٢n + 2p	the third
Daily exams	+ PowerPoint availability of materials for this	Density and specific gravity of solution	Density of the solution and its specific gravity	٢n + 2p	the fourth
Daily exams	Monthly exam	Exam.	First semester exam	٢n + 2p	Fifth

Daily exams	+ PowerPoint availability of materials for this	The relationship between molarity or normality with percentage concentration	Relationship between molar, normal and percentage concentration	٢n + 2p	VI
Daily exams	+ PowerPoint availability of materials for this	Diluting solutions	Dilute solutions	٢n + 2p	Seventh
Daily exams	+ PowerPoint availability of materials for this	Concentration by percent	Concentration in percentage	٢n + 2p	VIII
Daily exams	+ PowerPoint availability of materials for this	P-functions	Acid function	٢n + 2p	Ninth
Daily exams	+ PowerPoint availability of materials for this	Volumemetric analysis	Volumetric analysis	٢n + 2p	The tenth
Daily exams	+ PowerPoint availability of materials for this	Standard solution	Dilute solutions	٢n + 2p	eleventh
Daily exams	+ PowerPoint availability of materials for this	Acid-Base equilibrium	Acid-base balance	٢n + 2p	twelve
Daily exams	+ PowerPoint availability of materials for this	Buffer solution	Buffer solutions	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint availability of materials for this	Enthalpy	Enthalpy	٢n + 2p	fourteenth
Daily exams	Monthly exam	Exam.	Second semester exam	٢n + 2p	Fifteenth

٢. headquarters Evaluation of the

The theoretical part	Final exam / 34 marks	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	
practical part	Final exam/16 marks	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam Daily exam ٤ grades	

٣. Learning and teaching resources

Required textbooks (methodology, if any)	. Introduction to analytical chemistry Fundamentals of analytical chemistry
Main references (sources)	Skoog (Fundamentals of Analytical Chemistry) 9 edition (Thomson, 2014)
Recommended supporting books and references (scientific journals, reports...)	Daniel harris (Quantitative chemical analysis) (2006) Gary D. Christian (Analytical Chemistry) 7th Ed, 2014
Electronic references, Internet sites	

١. Course name	
.organic chemistry	
٢. Course symbol	
٣. Semester/year	
Semester system / 2023-2024	
٤. The date this description was prepared	
٢٠٢٤/٤/٤	
٥. Available forms of attendance	
Is mandatory	
٦. Number of study hours (total)/number of units (total)	
٤ per week (2 hours theoretical part + 2 hours practical part) / number of units = 3	
٧. Name of the course administrator (if more than one name is mentioned)	
Name: M. M. Muhammad Jabbar Muhammad mohammedjabbar0908 @gmail.com : Email	
٢. objectives Course	
:The graduate must be able to know and understand all of the following **١. Naming organic compounds into their different categories according to a naming system** **٢. Solve problems, demonstrating understanding of the basic principles and mastery of organic chemistry** **٣. Linking the chemical composition of organic compounds to their properties** **٤. Knowledge of aromatic compounds and their interactions** **٥- Explaining different chemical reactions according to reaction mechanics** **٦- Explain the physical properties of organic compounds**	**Objectives of the study subject**
٣. Teaching and learning strategies	

The main strategy that will be adopted in achieving this The unit aims to encourage students' participation in exercises while they are at At the same time improving and expanding their critical thinking skills. this will be It is .achieved through classrooms and interactive educational programs	The strategy

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	+ PowerPoint availability of materials for this	Introduction of organic chemistry	Introduction to organic chemistry	٢n + 2p	the first
Daily exams	+ PowerPoint availability of materials for this	Nomenclature of alkanes	Naming the cans	٢n + 2p	the second
Daily exams	+ PowerPoint availability of materials for this	Structure and physical properties of alkanes	Physical properties of alkanes	٢n + 2p	the third
Daily exams	+ PowerPoint availability of materials for this	Reaction of alkanes	Alkanes interactions	٢n + 2p	the fourth
Daily exams	Retn	Exam.	First semester exam	٢n + 2p	Fifth
Daily exams	+ PowerPoint availability of materials for this	Synthesis of alkanes	Installation of cans	٢n + 2p	VI
Daily exams	+ PowerPoint availability of materials for this	Nomenclature of alkene	Naming the alkene	٢n + 2p	Seventh
Daily exams	+ PowerPoint availability of materials for this	Structure and physical properties of alkenes	Physical properties of alkenes	٢n + 2p	VIII

Daily exams	+ PowerPoint availability of materials for this	Reaction of alkenes	Alkainate reactions	٢n + 2p	Ninth
Daily exams	+ PowerPoint availability of materials for this	Synthesis, and reactions of alkenes	Structure and properties of alkene	٢n + 2p	The tenth
Daily exams	+ PowerPoint availability of materials for this	Nomenclature of alkyne	Naming alkenes	٢n + 2p	eleventh
Daily exams	+ PowerPoint availability of materials for this	Structure and physical properties of alkynes	Structure and physical properties of alkenes	٢n + 2p	twelve
Daily exams	+ PowerPoint availability of materials for this	Reaction of alkynes	Alkyne reaction	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint availability of materials for this	Aromatic compounds and aromatic substitution reactions	Aromatic compounds	٢n + 2p	fourteenth
Daily exams	Retn	Exam.	Second semester exam	٢n + 2p	Fifteenth

٢. Course evaluation

	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	Final exam / 34 marks	The theoretical part	
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part	

Learning and teaching resources .٣	
Required textbooks (methodology, if any)	.Introduction to organic chemistry Basics of organic chemistry
Main references (sources)	Allyn and Bacon.Organic Chemistry, 6th ed., 1992,
Recommended supporting books and references (scientific journals, reports...)	aula Y. Bruice.Organic Chemistry, 6th ed., 2011
Electronic references, Internet sites	

Name of the course .١
English
Course code .٢
Semester/ year .٣
Semester system / 2023-2024
The date this description was prepared .٤
٢٠٢٤/١٥/١
A Available forms of attendance.٥
Is mandatory
Number of study hours (total)/number of units (total) .٦
hours per week / number of units = 2 ٢
Name of the course administrator (if more than one name is mentioned) .٧
shaymaa@uodiyala.edu.iq Name: A. Prof. Dr. Shaima Hatem Al Majma'i Email
objectives Course .٨

Enables students to clearly understand the proper use of verb tenses. **The student will have the ability to write an essay.** **e student will be able to improve his knowledge and expand his vocabulary.** **Enhancing students' listening skills** **Distinguish basic vocabulary in various topics**	**jectives of the study subject**

Teaching and learning strategies .٩

The strategy	
Introduce new material using small steps Support students in developing a growth mindset: We can do – this using many of the strategies already described ,modeling, segmenting, checking for understanding .questioning, and collaborative learning to name a few Check students' understanding using reports and exams	

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	+ PowerPoint seminars	General introduction and rules of how to speak English fluently	Understand the principles and basics related to the subject	n ٢	the first
Daily exams	+ PowerPoint seminars	The present simple and continuous tense and its applications	Understand the principles and basics related to the subject	n ٢	the second
Daily exams	+ PowerPoint seminars	The present perfect tense and its applications	Understand the principles and basics related to the subject	n ٢	the third
Daily exams	+ PowerPoint seminars	The past simple and continuous and its applications	Understand the principles and basics related to the subject	n ٢	the fourth
Daily exams	+ PowerPoint seminars	The past perfect tense and its applications	Understand the principles and basics related to the subject	n ٢	Fifth
Daily exams	+ PowerPoint seminars	For a simple and continuous And its future applications	Understand the principles and basics related to the subject	n ٢	VI

Daily exams	+ PowerPoint seminars	The future perfect tense and its applications	Understand the principles and basics related to the subject	n ٢	Seventh
Daily exams	+ PowerPoint seminars	auxiliary verbs	Understand the principles and basics related to the subject	n ٢	VIII
Daily exams	+ PowerPoint seminars	Prepositions	Understand the principles and basics related to the subject	n ٢	Ninth
Daily exams	+ PowerPoint seminars	Mid termexam	Exam	n ٢	The tenth
Daily exams	+ PowerPoint seminars	irregular acts	Understand the principles and basics related to the subject	n ٢	eleventh
Daily exams	+ PowerPoint seminars	Capitalization rules	Understand the principles and basics related to the subject	n ٢	twelve
Daily exams	+ PowerPoint seminars	Formal sentences and informal sentences	Understand the principles and basics related to the subject	n ٢	Thirteenth
Daily exams	+ PowerPoint seminars	Narrative tenses	Understand the principles and basics related to the subject	n ٢	fourteenth
Daily exams	PowerPoint seminars +	reading	Understand the principles and basics related to the subject	n ٢	Fifteenth

٤. Course evaluation

	Pursuit score/10 exam score degree projects ١٠ marks language practice ١٠ activity levels ١٠ marks daily exams ١٠	Final exam / 50 marks	The theoretical part

٥. Learning and teaching resources

English grammar book ReadingEnglish	Required textbooks (methodology, if any)

Cowdry, E. V. (Ed.). (2014). General cytology: a textbook of cellular structure and function for students of biology and medicine. University of Chicago Press.	Main references (sources)
ollard, T. D., Earnshaw, W. C., Lippincott-Schwartz, J., & Johnson, G. (2022). Cell iology E-book. Elsevier Health Sciences.	Recommended supporting books and references (scientific journals, reports...)
	Electronic references, Internet sites

Name of the course .١
General biology
Course code .٢
BIT−1101
Semester/ year .٣
Semester system / 2023−2024
The date this description was prepared .٤
٢٠٢٣/١١/١
A Available forms of attendance.٥
Is mandatory
Number of study hours (total)/number of units (total) .٦
per week (4 hours theoretical part + 2 hours practical part) ٦
Name of the course administrator (if more than one name is mentioned) .٧
shaymaa@uodiyala.edu.iq Name: A. Prof. Dr. Shaima Hatem Al Majma'i Email
objectives Course

ectives of the study subject	• Develop students' understanding of the interconnectedness of living organisms. • The student will be able to explain the characteristics of living organisms and levels of life. • he student will be able to describe the transfer of energy in organisms in an ecosystem. • The student's understanding of the scope of biology and the molecular basis of life

• Introduction to describing life activities from a cellular perspective • Handle basic biological instrument, record data and draw conclusions • evelop scientific orientation and skill and conduct biological experiments using scientific procedures • Understand the basic processes of energy transfer and synthesis of intermediate or final products in living cells	

Teaching and learning strategies

❖ Introduce new material using small steps ❖ Support students in developing a growth mindset using many of the strategies already outlined – modeling, chunking, checking for understanding, questioning and collaborative learning to name a few. ❖ Check students' understanding using reports and exams	The strategy

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	+ PowerPoint seminars	Microscope	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	the first
Daily exams	+ PowerPoint seminars	Prokaryotic and Eukaryotic cell and Plasma membrane	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	the second
Daily exams	+ PowerPoint seminars	Cytoskeletons, Lysosomes, mitochondria, nucleus, Golgi appatus and Cell Division.	Understand the theoretical and practical principles and fundamentals	+ ٢n ٢p	the third

			related to the subject		
Daily exams	+ PowerPoint seminars	Life kingdoms and scientific names.	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	the fourth
Daily exams	+ PowerPoint seminars	Animal tissue (Epithelial Tissues, Connective Tissues, Muscle Tissue, Nervous Tissues).	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	Fifth
Daily exams	+ PowerPoint seminars	Taxonomy and Classification of Animals: The Animal Kingdom: Subkingdom Protozoa (single-celled animals).	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	VI
Daily exams	+ PowerPoint seminars	Subkingdom Metazoa (multi-cellular animals): Phylum: Platyhelminthes [Flatworms].	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	Seventh
Daily exams	+ PowerPoint seminars	Phylum: Acanthocephala [Spiny-Headed Worms, Phylum: Porifera [Sponges], Phylum: Mollusca.	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	VIII
Daily exams	+ PowerPoint seminars	Phylum: Chordata, class: Amphibia	Understand the theoretical and practical principles and fundamentals	+ ٢n ٢p	Ninth

			related to the subject		
Daily exams	+ PowerPoint seminars	Mid term	the exam	+ ٢n ٢p	The tenth
Daily exams	+ PowerPoint seminars	Plant cell, The cell wall, functions and structure.	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	eleventh
Daily exams	+ PowerPoint seminars	Plant cell Living and non-living components in a plant cell.	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	twelve
Daily exams	+ PowerPoint seminars	Plant Tissues and organs (leaf, stem, flowers, fruits and roots)	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	Thirteenth
Daily exams	+ PowerPoint seminars		Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	fourteenth
Daily exams	+ PowerPoint seminars	Plantfamilies.	Understand the theoretical and practical principles and fundamentals related to the subject	+ ٢n ٢p	Fifteenth
Course evaluation					

	Endeavor score/10 degree exam score degree projects ١٠ marks for daily exams ١٠ degrees of activity ١٠ marks practical ١٠	Quest / 50 degrees	The theoretical and practical part	
	Theoretical exam/35 marks Practical exam/15 marks	Final exam / 50 marks	The theoretical and practical part	

Learning and teaching resources

General Biology	equired textbooks (methodology, if (any
Cowdry, E. V. (Ed.). (2014). General cytology: a textbook of cellular structure and function for students of biology and medicine. University of Chicago Press.	Main references (sources)
lard, T. D., Earnshaw, W. C., Lippincott-Schwartz, J., Johnson, G. (2022). Cell biology E-book. Elsevier Health Sciences.	Recommended supporting books ,and references (scientific journals (...reports
ttps://www.open.ac.uk/courses/biology	lectronic references, Internet sites

Name of the course .١
Practical computer
Course code .٢
Semester/ year .٣
Semester system / 2023-2024
Date this description was prepared
٢٠٢٤/٢٤/٤
A. Available attendance forms
Is mandatory
Number of study hours (total)/number of units (total)
per week (two hours practical part) / number of units = 1 ٤
Name of the course administrator (if more than one name is mentioned)
: email Theasmaelsalih@uodiyala.edu.iq Name: Lecturer Ismail Saleh Arif
objectives Course

Objectives of the study subject	The course aims to provide students with the basic computer skills necessary to enrich their intellectual and artistic stock in the fields of computer science and its various applications, as well as introducing the student to some important programs that support his academic achievement.

Teaching and learning strategies

:The graduate must be able to know and understand all of the following Basic principles of computer .١ . Knowledge and application of the operating system.٢ Sufficient experience to work on creating reports using text editors, such as .٣ Word Knowing and understanding how to browse the Internet and protect the .٤ .computer	The strategy

Course structure .٦

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	Practical application on the computer b	Overview of computers and their basic components and applications	Understanding computer basics	٢n + 2p	the first
Daily exams	Practical application on the computer b	Introduction to windows operations system	Understand the introduction to the operating system	٢n + 2p	the second
Daily exams	Practical application on the computer b	Operation System properties, Difference between OS, program, software, application	Operating system characteristics	٢n + 2p	the third
Daily exams	Practical application on the computer b	Network and internet (setting, www, email, search engine)	Understand the working of computer networks	٢n + 2p	the fourth
Daily exams	Practical application on the computer b	**Microsoft Office Word:** Editing a Document and Formatting Text and Paragraphs	Introduction to the printing and writing	٢n + 2p	Fifth

			program Word		
Daily exams	Practical application on the computer b	**Microsoft Office Word:** Adding Tables and Inserting Graphic Objects	Learn how to ,add tables pictures, and other shapes	٢n + 2p	VI
Daily exams	Practical application on the computer b	**Microsoft Office Word:** Controlling Page Appearance and Proofing a Document	Understand how to edit and correct written text	٢n + 2p	Sevent h
Daily exams	Practical application on the computer b	**Microsoft Office Excel:** Getting Started with Excel	Getting to know the electronic spreadsheet program	٢n + 2p	VIII
Daily exams	Practical application on the computer b	**Microsoft Office Excel:** Sorting, Selecting and Sub totaling data	Initial features and basic tools of Access	٢n + 2p	Ninth
Daily exams	Practical application on the computer b	**Microsoft Office Excel:** Formulas and Functions	Equations and how to use them	٢n + 2p	The tenth
Daily exams	Practical application on the computer b	**Microsoft Office Excel:** Worksheet Formatting and Presentation	Create two worksheets of different shapes	٢n + 2p	elevent h
Daily exams	Practical application on the computer b	**Microsoft Office Power Point:** Getting Started with Power Point	Learn about presentation software	٢n + 2p	twelve
Daily exams	Practical application on the computer b	**Microsoft Office Power Point :** Developing a PowerPoint Presentation, Adding Graphical	Add shape formatting properties	٢n + 2p	Thirtee nth

		Elements to Your Presentation and Modifying Objects in Your Presentation			
Daily exams	Practical application on the computer b	**Microsoft Office Power Point :** Adding Graphical Elements, tables and charts to your Presentation and Modifying Objects in Your Presentation	Adding images and other effects to PowerPoint	٢n + 2p	fourtee nth
Application on computer	-------	**Exam**	Second semester exam	٢n + 2p	Fifteen th

٧. Course evaluation

	Pursuit score/20 marks for first semester exam marks for the second semester ٢٠ exam marks daily exams ١٠	Final exam / 50 marks	practical part	

٨. Learning and teaching resources

esktop And its applications the computer basics the first and the second **Section**	equired textbooks (methodology, if (any
	Main references (sources)
	Recommended supporting books ,and references (scientific journals (...reports
ps://www.youtube.com/channel/UC4do33q3Ho1XBAs tCgfUu6g	lectronic references, Internet sites

second phase

٩. Course Name	
Medical microbiology	
١٠. Course Code	
١١. Semester/ year	
Semester system / 2023-2024	
١٢. Date this description was prepared	
٢٠٢٤/٢٢/٤	
١٣. A. Available attendance forms	
Is mandatory	
١٤. Number of study hours (total)/number of units (total)	
per week (2 hours theoretical part + 2 hours practical part) / number of units = 4 ٤	
١٥. Name of the course administrator (if more than one name is mentioned)	
hiba.a@uodiyala.edu.iq : Ami -Name: M.M. Heba Ali Hilal Al	
١٦. objectives Course	
ectives of the study subject	➢ **Know the history of the emergence and development of medical microbiology** ➢ **Study medical microbiology in detail** ➢ **dying the causes of diseases, their methods of spread, and the epidemics they cause** ➢ **Learn to isolate and diagnose pathogens in detail from infected people** ➢ **owledge of ways to prevent dangerous pathogens and avoid their spread or the spread of epidemics resulting from them**
١٧. Teaching and learning strategies	

:The graduate must be able to know and understand all of the following **١. Basic principles of microbiology** **٢. The ability to isolate and diagnose pathogens from clinical or non-clinical samples** **٣. Knowing and understanding the ways in which various diseases spread and reducing or avoiding them** **٤. Sufficient capacity to work in health institutions and facilities, volunteer campaigns, or isolation rooms in cases of rapidly spreading epidemics .** **٥. The graduate must be fully qualified to work as a laboratory technician in the Central Organization for Standardization and Quality Control, a school health and safety supervisor, or an evaluator of preventive measures for restaurants, butcher shops, or various food preservation stores.**	**The strategy**

١٨. Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Brainstorming	+ PowerPoint Provides personal biosecurity protections	Biosafety levels	Principles of safety and biosecurity	٢n + ٢p	the first
Brainstorming + daily exams	+PowerPoint Special materials and equipment	Decontamination, sterilization	Sterilization and disinfection	٢n + ٢p	the second
Brain storming	+ PowerPoint availability of materials and media for examinations	Biochemical tests (sugar fermentation tests)	Biochemical tests Fermentation tests	٢n + ٢p	the third
+ Brainstorming conducting	+ PowerPoint provides special	TSI test	Testing the fermentation of	٢n + ٢p	the fourth

experiments in the laboratory	environments for isolation and tests		trisaccharides iron +		
Daily exams	Spots	Exam.	First semester exam	+ ٢n ٢p	Fifth
+Brainstorming Conducting experiments in the laboratory	+ PowerPoint ,provides media solutions, and Test reagents	IMViC test	Quadruple test	+ ٢n ٢p	VI
+Brainstorming Conducting experiments in the laboratory	+PowerPoint Special environments and tools	Virulence factors	Detection of virulence factors of pathogenic bacteria	+ ٢n ٢p	Seventh
+Brainstorming Conducting experiments in the laboratory	+ PowerPoint special solutions and reagents	Catalase, oxidase, urease and motility tests	Enzyme detection tests	+ ٢n ٢p	VIII
+Brainstorming Conducting experiments in the laboratory	+ PowerPoint private circles	Antibiotic susceptibility test	Antibiotic sensitivity test	+ ٢n ٢p	Ninth
+Brainstorming Conducting experiments in the laboratory	+ PowerPoint special media and solutions	Microbiological skin tests	Detection of skin pathogens	+ ٢n ٢p	The tenth
+Brainstorming Conducting experiments in the laboratory	+ PowerPoint ,special tools media, and solutions	Microbiological septum tests	Sputum examination	+ ٢n ٢p	eleventh
+Brainstorming Conducting experiments in the laboratory	+ PowerPoint ,special tools media, and solutions	Microbiological mouth tests	Isolation of oral pathogens	+ ٢n ٢p	twelve
+Brainstorming	+ PowerPoint ,special tools	Microbiological urine tests	Isolation of urinary tract pathogens	+ ٢n ٢p	Thirteenth

Conducting experiments in the laboratory	media, and solutions				
+Brainstorming Conducting experiments in the laboratory	+ PowerPoint ,special tools media, and solutions	Microbiological blood test	Isolation of blood pathogens	+ ٢n ٢p	fourteenth
Daily exams	Spots	Exam.	Second semester exam	+ ٢n ٢p	Fifteenth

١٩. Course evaluation

The theoretical part	Final exam / 34 marks	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦
practical part	Final exam/16 marks	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤

٢٠. Learning and teaching resources

quired textbooks (methodology, if (any	.(Riedel.S. ;Morse.SA .;Mietzner.T;Miller.S.(Jawetz),(2019 elnick and Adelberg's, Medical microbiology, 28th edition. The McGraw-Hill .New York
Main references (sources)	**Harley, J.P. and L.M. Prescott. 2002. Laboratory Exercises in .Microbiology** **.ed. The McGraw-Hill Companies, Inc., New York th**
Recommended supporting books and references (scientific (...journals, reports	**Vandepitte, J.; J. Verhaegen; K. Engbaek; P. Rohner; P. Piot; .andCC** **Heuck. 2003. Basic Laboratory Procedures in Clinical Bacteriology. 2nd.ed.** **World Health Organization, Geneva**

	Electronic references, Internet sites

١. Course Name
Microbiology physiology
٢. Course Code
٣. Semester / year
Semester system / 2023-2024
٤. Date this description was prepared
4/22/2024
٥. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
week (2 hours theoretical part + 2 hours practical part) / number of units 4 = 3
٧. Name of the course administrator (if more than one name is mentioned)
Al-Aymi to Zainab Abdel Muhammad .Name : M. Dr zainababed@uodiyala.edu.iq
٨. Course objectives

ectives of the study subject	The graduate must be able to know and understand all of the following 1. Basic principles of microbial physiology 2. Know and understand the types of microbial tests and their purpose . 3. Know and understand all the different methods of microbial physiology . ٤. Know and understand all microbial enzyme tests.
٩. Teaching and learning strategies	
The strategy	Provide students with the foundations and topics related to the knowledge and systems described in: ١- Clarification and explanation of study materials by faculty members through the use of the whiteboard LCD screens, and e-learning displaying data, PowerPoint using publishing video lectures On the YouTube channel. ٢- Providing students with knowledge through academic vocabulary homework assignments

٣- Asking students to visit the library to obtain academic knowledge related to academic vocabulary ٤- Improving students' skills by visiting websites to obtain additional knowledge of topics Scholarship ٥-Brainstorming during the lecture	

١٠. Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	+ PowerPoint provides materials and materials for this	Introduction to microbial physiology	Introduction to microbial physiology	٢n + 2p	the first
Daily exams	+ PowerPoint provides materials and materials for this	The cell Wall (Outer Membrane)	The cell Wall (Outer Membrane)	٢n + 2p	the second
Daily exams	+ PowerPoint provides materials and materials for this	Microbial Nutrition	Microbial Nutrition	٢n + 2p	the third
Daily exams	+ PowerPoint provides materials and materials for this	Microbial Cultivation	Microbial Cultivation	٢n + 2p	the fourth
Daily exams	Spots		Microbial Adaptation	٢n + 2p	Fifth
Daily exams	+ PowerPoint provides materials and materials for this	Exam	Exam	٢n + 2p	VI
Daily exams	+ PowerPoint provides	Microbial Adaptation	Heart and Soul of Evolution	٢n + 2p	Seventh

	materials and materials for this				
Daily exams	+ PowerPoint provides materials and materials for this	Catabolic Pathways	Catabolic Pathways	٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials and materials for this	Electron Transport Chain	Electron Transport Chain	٢n + 2p	Ninth
Daily exams	+ PowerPoint provides materials and materials for this	Glycolysis	Glycolysis	٢n + 2p	The tenth
Daily exams	+ PowerPoint provides materials and materials for this	Fermentation pathways	Fermentation pathways	٢n + 2p	eleventh
Daily exams	+ PowerPoint provides materials and materials for this	Microbial stress responses	Microbial stress responses	٢n + 2p	twelve
Daily exams	+ PowerPoint provides materials and materials for this	Nitrogen assimilation & environmental sensing and response	Nitrogen assimilation & environmental sensing and response	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint provides materials and materials for this	Cell to cell communication	Cell to cell communication	٢n + 2p	fourteenth
Daily exams	Spots	Exam.	Exam.	٢n + 2p	Fifteenth

١١. Course evaluation

The theoretical part	Final exam / 34 marks	Pursuit score / 14 first semester exam marks marks for the second semester 14 exam grades daily exams 6
practical part	Final exam /16 marks	Pursuit grade / 6 first semester exam grade marks for the second semester 6 exam daily exam grades 4

٢١. Course Name	
Phosphorus is a plant	
٢٢. Course Code	
٢٣. Semester/ year	
Semester system / 2023-2024	
٢٤. Date this description was prepared	
٢٠٢٤/٢٣/٤	
٢٥. A. Available attendance forms	
Is mandatory	
٢٦. Number of study hours (total)/number of units (total)	
per week (2 hours theoretical part + 2 hours practical part) / number of units = 3 ٤	
٢٧. Name of the course administrator (if more than one name is mentioned)	
najwanabbas@gmail.com :Amiel - Name: Dr. Najwan Abbas Muhammad Al	
٢٨. objectives Course	
ectives of the study subject	**nt physiology is the study of how plants function. In this chapter It will focus on loring the relationship between form and function in plants. This course is designed survey contemporary aspects of plant physiology with emphasis on modern Research gress in the fields Self Relevance . I had Threads relations Watercolor Vegetarianism transport, mineral nutrition and carbon and nitrogen metabolism (photosynthesis respiration, and nitrogen assimilation) and plant growth development**

	derstanding plant biology has implications for our ability to address applied questions l issues facing our world today such as… Agricultural concerns, changes and reased appreciation for plants being wonderful and important ingredients Our living . world

٢٩. Teaching and learning strategies

The strategy	:The graduate must be able to know and understand all of the following ١* . Identify the importance of water for plants and study water relations ٢- And water Identify water potential and theories of movement and absorption .transfer ٣- Study photosynthesis and learn about light and dark reactions in plants . Carbon, quaternary carbon , and succulent plants ٤- Study respiration in plants and learn about the types of respiration, the . respiration factor, and the respiration mechanism ٥- nd Gabriel is nat . Identifying plant hormones , the types of which are auxins And that 's it Absicic acid and ethyne , and the importance of these hormones

٣٠. Course structure

the week	hours	Required learning outcomes	Learning method	Evaluation method
the first	٢n + 2p	Natural solutions	+ Presentation educational video + lecture + file educational panel	Daily exams
the second	٢n + 2p	Mechanisms of water transport within plants	+ Presentation educational video + lecture + file educational panel	Daily exams
the third	٢n + 2p	Diffusion of solutions	+ Presentation educational	Daily exams

	video + lecture + file educational panel			
Daily exams	+ Presentation educational video + lecture + file educational panel	Hydrogen ion concentration	٢n + 2p	the fourth
Daily exams	+ Presentation educational video + lecture + file educational panel	Osmosis	٢n + 2p	Fifth
Daily exams	+ Presentation educational video + lecture + file educational panel	,Imbibition permeability and plasmasis	٢n + 2p	VI
Exam	Exam	the first exam	٢n + 2p	Seventh
Daily exams	+ Presentation educational video + lecture + file educational panel	Water stress	٢n + 2p	VIII
Daily exams	+ Presentation educational video + lecture + file educational panel	Mechanisms of transport and absorption of salts within the plant	٢n + 2p	Ninth
Daily exams	+ Presentation educational video + lecture + file educational panel	Transpiration and tears	٢n + 2p	The tenth

	Daily exams	+ Presentation educational video + lecture + file educational panel	Photosynthesis and photosynthetic pigments	٢n + 2p	eleventh
	Daily exams	+ Presentation educational video + lecture + file educational panel	Respiration in plants	٢n + 2p	twelve
	Daily exams	+ Presentation educational video + lecture + file educational panel	Factors affecting breathing	٢n + 2p	Thirteenth
	Daily exams	+ Presentation educational video + lecture + file educational panel	Plant hormones and growth hormones	٢n + 2p	fourteenth
	Exam	Exam	Second semester exam	٢n + 2p	Fifteenth

٣١. Course evaluation

The theoretical part	Final exam / 34 marks	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	
practical part	Final exam/16 marks	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	

٣٢. Learning and teaching resources

Required textbooks (methodology, if any)	sbury, F. B., & Ross, C. W. (2000). Plant Physiology 1. 304 pp. Spain. Paraninfo SA Madrid. España

Hopkins, G. W. (2009). Introduction to plant physiology. John Wiley & Sons, Inc.	Main references (sources)

third level

١. Course Name
Antibiotics
٢. Course Code
٣. Semester/year
Semester system / 2023-2024
٤. Date this description was prepared
4/20/2024
٥. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
٤ per week (2 hours theoretical part + 2 hours practical part) / number of units = 3
٧. Name of the course administrator (if more than one name is mentioned)
zainabamer@uodiyala.edu..iq : Amel Zainab Amer Hatem Al Dr . M .Name: A
٨. objectives Course

ectives of the study subject	١. ,Introducing the student to antibiotics in terms of their composition, use and relationship to treating pathological conditions through identifying and diagnosing bacterial species, knowing the type of disease, and thus knowing the use of the appropriate type of antibiotic to treat this .disease ٢. Introducing the student to the classical methods for diagnosing pathological infections and thus knowing the different types of antibiotics that work on different parts of the bacteria, such as the cell wall, the cytoplasmic membrane, the structure of nucleic acids, and the technical developments taking place in this science, such as chemical and . molecular methods

٩. Teaching and learning strategies	
The strategy	:The graduate must be able to know and understand all of the following ١- Covering the basics of antibiotics ٢- A complete understanding of how antibiotics in all their forms work against types .of bacteria, parasites, fungi, and viruses ٣- Identify the types of antibiotics ٤- Identify the mechanisms of antibiotic resistance

Course structure .١٠

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	The style of lectures and seminars	Introduction to Antimicrobial and Drug Therapy	Understanding the important theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the first
″	″	Sources, Mechanism of action of Antibiotics	Understanding the important theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the second
″	″	**Action on nucleic acids**	″	٢n + 2p	the third
″	″	**Action on proteins**	″	٢n + 2p	the fourth
″	″	**Action on cell wall**	″	٢n + 2p	Fifth
The student's grade on the exam is in addition to the daily exam average	Test hall for the theoretical exam and spots for the practical part	First exam	First exam	٢n + 2p	VI
Daily exams	Style of lectures and seminars	Pharmacology of Antibiotics& hypersensitivity	Understanding the important theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Seventh
″	″	Pharmacokinetics of Antibiotics	Understanding the important theoretical and practical principles and fundamentals	٢n + 2p	VIII

			related to the subject		
″	″	Bacteriostatic vs Bactericidal, MIC	″	٢n + 2p	Ninth
″	″	Antimetabolites, Toxicity of Antibiotics	″	٢n + 2p	The tenth
″	a	Mechanism of resistance to antibiotics Future Antibiotics	″	٢n + 2p	eleventh
″	″	Toxins-I: Biotoxins	″	٢n + 2p	twelve
″	″	Toxin-II: Bacterial toxins	″	٢n + 2p	Thirteenth
The student's grade on the exam is in addition to the daily exam average	Test hall for the theoretical exam and spots for the practical part	**Second exam**	Second exam	٢n + 2p	fourteenth
The student's score on the exam	Test hall for the theoretical exam and spots for the practical part	Final exam.	End of course exam	٢n + 2p	Fifteenth

١١. Course evaluation

The theoretical part	Final exam / 34 marks	marks for first15 /Pursuit score semester exam marks for the15 second semester exam daily exam grades4	
practical part	Final exam/16 marks	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	

١٢. Learning and teaching resources

Text books	equired textbooks (methodology, if any)
١. 1. Walsh, C. (2003). Antibiotics: actions, origins, resistance. American Society for Microbiology (ASM). ٢. Bhattacharjee, M. K. (2016). Chemistry of antibiotics and related drugs (Vol. 219). Cham: Springer ٣. Shareef, FM, 2012. Medical Fungi, Ist. ed. AlThakera Publishing & Distributors, Irbil, Iraq, Pp 608 ٤. Description of medical fungi 2nd ed .(2016) Editor:Ellis *et al*	Main references (sources)

1 Text books	Recommended supporting books and ,references (scientific journals (...reports
https://www.futurelearn.com/subjects/healthcare-medicine-courses/antimicrobial-and-antibiotic-resistance	Electronic references, Internet sites

١. Course Name
٢. Course Code
٣. Semester/year
Semester system / 2023-2024
٤. Date this description was prepared
٢٠٢٤/٢٣/٤
٥. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
٤ er week (2 hours theoretical part + 2 hours practical part) / number of units ٣
٧. Name of the course administrator (if more than one name is mentioned)
maan.alyaa@yahoo.com :tend not Al-Hamid does slave Maen Alia Dr M Name: A
٨. objectives Course

ectives of the study subject	• The other With science And his relationship Molecular Biological • And RNA DNA And creation installation • d Real cells in Relationship Self And enzymes DNA Doubled Nucleus primitive • cleus And primitive Real cells in All three In its stages RNA cloning • All three All kinds RNA And constructive Synthesis • ith acids associated And proteins Its types And Definition Proteins Nuclear • d Real cells in RNA And translation Protein manufacturing Nucleus primitive • tein manufacturing And organization Genetic And expression Genes

٩. Teaching and learning strategies	
The strategy	:The graduate must be able to know and understand all of the following • The central idea of molecular biology and its elements • (DNA) Chemical and physical structure of genetic material • its typesand Chemical structure of RNA • the genetic materialis Evidence that DNA • The process of replication of genetic material in eukaryotic organisms • (cloning and translation)Gene expression Gene • gene regulationOperon • Genetic mutations • repair systemsDNA

١٠. Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	+ PowerPoint provides materials and materials for this	Identify the equipment used in the laboratory and how to use it	Identify the equipment used in the laboratory and how to use it	٢n + 2p	the first
Daily exams	+ PowerPoint provides materials and materials for this	Learn about methods for preparing molar and standard solutions	Learn about methods for preparing molar and standard solutions	٢n + 2p	the second
Daily exams	+ PowerPoint provides materials and materials for this	Preparation of genomic DNA from prokaryotic cells	Preparation of genomic DNA from prokaryotic cells	٢n + 2p	the third
Daily exams	+ PowerPoint provides materials and materials for this	Preparation of genomic DNA from eukaryotic cells	DNA to prepare from Genomic Nucleus Real cells	٢n + 2p	the fourth
Daily exams	Spots	Exam.	First semester exam	٢n + 2p	Fifth
Daily exams	+ PowerPoint provides materials and materials for this	Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight	Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight	٢n + 2p	VI
Daily exams	+ PowerPoint provides materials and materials for this	Study of DNA properties such as purity and absorption spectrum	Study of DNA properties such as purity and absorption spectrum	٢n + 2p	Seventh
Daily exams	+ PowerPoint availability of materials for this	The effect of some factors on DNA stability	The effect of some factors on DNA stability	٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials and	Preparation of RNA from yeast	Preparation of RNA from yeast	٢n + 2p	Ninth

	materials for this				
Daily exams	+ PowerPoint availability of materials for this	Migration of RNA on an agarose gel	Migration of RNA on an agarose gel	٢n + 2p	The tenth
Daily exams	+ PowerPoint provides materials and materials for this	Protein extraction and purification from eukaryotic and prokaryotic cells	Protein extraction and purification from eukaryotic and prokaryotic cells	٢n + 2p	eleventh
Daily exams	+ PowerPoint availability of materials for this	Migration of proteins on a polyacrylamide gel	Migration of proteins on a polyacrylamide gel	٢n + 2p	twelve
Daily exams	+ PowerPoint availability of materials for this	Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight	Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint availability of materials for this	Study of DNA properties such as purity and absorption spectrum	Study of DNA properties such as purity and absorption spectrum	٢n + 2p	fourteenth
Daily exams	Spots	Exam.	Second semester exam	٢n + 2p	Fifteenth

١١. Course evaluation

	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	Final exam / 34 marks	The theoretical part
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part

١٢. Learning and teaching resources

Molecular Biology Basics	Required textbooks (methodology, if any)
Diagnostic Molecular Biology	Main references (sources)
Molecular diagnostics	Recommended supporting books and references (scientific journals, reports...)

ttps://sigmaearth.com/ar/Overview / biologymolecular	Electronic references, Internet sites

١. Course Name
٢. Course Code
٣. Semester/year
Semester system / 2023-2024
٤. Date this description was prepared
٢٠٢٤/٢٣/٤
٥. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
٤ per week (2 hours theoretical part + 2 hours practical part) / number of units ٣
٧. Name of the course administrator (if more than one name is mentioned)
Name: Alia Dr Maen Alyaa Al-Hamid does not attend: maan.alyaa@yahoo.com
٨. objectives Course

ectives of the study subject	• DNA Doubled Nucleus primitive Real cells in Relationship Self And enzymes • RNA cloning All three In its stages Real cells in All three And primitive Nucleus • All three All kinds RNA And constructive Synthesis • Proteins Nuclear Its types And Definition Proteins And acids associated • Protein manufacturing Nucleus primitive Real cells in RNA And translation • Genes Protein manufacturing And organization Genetic And expression

٩. Teaching and learning strategies	
The strategy	The graduate must be able to know and understand all of the following: • Evidence that DNA is the genetic material • The process of replication of genetic material in eukaryotic organisms • Gene expression Gene (cloning and translation) • Operon gene regulation • Genetic mutations • DNA repair systems

Course structure .١٠					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	+ PowerPoint provides materials and materials for this	Identify the equipment used in the laboratory and how to use it	Identify the equipment used in the laboratory and how to use it	٢n + 2p	the first
Daily exams	+ PowerPoint provides materials and materials for this	Learn about methods for preparing molar and standard solutions	Learn about methods for preparing molar and standard solutions	٢n + 2p	the second
Daily exams	+ PowerPoint provides materials and materials for this	Preparation of genomic DNA from prokaryotic cells	Preparation of genomic DNA from prokaryotic cells	٢n + 2p	the third
Daily exams	+ PowerPoint provides materials and materials for this	Preparation of genomic DNA from eukaryotic cells	DNA to prepare from Genomic Nucleus Real cells	٢n + 2p	the fourth
Daily exams	Spots	Exam.	First semester exam	٢n + 2p	Fifth
Daily exams	+ PowerPoint provides materials and materials for this	Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight	Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight	٢n + 2p	VI
Daily exams	+ PowerPoint provides materials and materials for this	Study of DNA properties such as purity and absorption spectrum	Study of DNA properties such as purity and absorption spectrum	٢n + 2p	Seventh
Daily exams	+ PowerPoint availability of materials for this	The effect of some factors on DNA stability	The effect of some factors on DNA stability	٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials and materials for this	Preparation of RNA from yeast	Preparation of RNA from yeast	٢n + 2p	Ninth
Daily exams	+ PowerPoint availability of materials for this	Migration of RNA on an agarose gel	Migration of RNA on an agarose gel	٢n + 2p	The tenth

Daily exams	+ PowerPoint provides materials and materials for this	Protein extraction and purification from eukaryotic and prokaryotic cells	Protein extraction and purification from eukaryotic and prokaryotic cells	٢n + 2p	eleventh
Daily exams	+ PowerPoint availability of materials for this	Migration of proteins on a polyacrylamide gel	Migration of proteins on a polyacrylamide gel	٢n + 2p	twelve
Daily exams	+ PowerPoint availability of materials for this	Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight	Electrophoresis of DNA extracted from experiments on agarose gels and measurement of molecular weight	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint availability of materials for this	Study of DNA properties such as purity and absorption spectrum	Study of DNA properties such as purity and absorption spectrum	٢n + 2p	fourteenth
Daily exams	Spots	Exam.	Second semester exam	٢n + 2p	Fifteenth

١١. Course evaluation

The theoretical part	Final exam / 34 marks	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	
practical part	Final exam/16 marks	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	

١٢. Learning and teaching resources

Required textbooks (methodology, if any)	Molecular Biology Basics
Main references (sources)	Diagnostic Molecular Biology
Recommended supporting books and references (scientific journals, reports...)	Molecular diagnostics
Electronic references, Internet sites	ttps://sigmaearth.com/ar/Overview / biologymolecular

١. Course Name	
Cytogenetics	
٢. Course Code	
٣. Semester/ year	
Semester system / 2023-2024	
٤. Date this description was prepared	
٤/٢٨/٢٠٢٤	
٥. A. Available attendance forms	
Is mandatory	
٦. Number of study hours (total)/number of units (total)	
٤ er week (2 hours theoretical part + 2 hours practical part) / number of units ٣	
٧. Name of the course administrator (if more than one name is mentioned)	
naseerkhalel@oudiyala.edu.iq :Amel - Name: Prof. Nasir Khalil Obaid Al	
٨. objectives Course	
ectives of the study subject	١- Covering the basics of molecular biology of eukaryotic and prokaryotic organisms . ٢ - A complete understanding of how the cells of living organisms work at the molecular level. ٣ - e possibility of using modern applications of molecular life science to develop various pharmaceutical and medical industries.
٩. Teaching and learning strategies	
The strategy	A1- The theoretical principles and foundations related to the scientific subject of cognitive sciences A2- The foundations of scientific research, methods of measurement, analysis, and finding solutions to scientific problems A3- The importance of theoretical scientific aspects related to the applications of various sciences A4- Scientific and linguistic terms and their definition of various scientific subjects

A5- Methods related to analyzing and designing scientific experiments for various scientific subjects	

Course structure .١٠

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	powerpoint	Introduction to cytogenetics		٢n + 2p	the first
Daily exams	powerpoint	Heterochromatin, euchromatin, and the nucleosome		٢n + 2p	the second
Daily exams	powerpoint	Chromosome replication, segregation, and the centrosome		٢n + 2p	the third
Daily exams	powerpoint	Numerical Abnormalities		٢n + 2p	the fourth
Daily exams	powerpoint	Structural Chromosome Abnormalities		٢n + 2p	Fifth
Daily exams	powerpoint	First exam		٢n + 2p	VI
Daily exams	powerpoint	Mechanisms of structural abnormalities		٢n + 2p	Seventh
Daily exams	powerpoint	Sex chromosomes, X chromosome inactivation		٢n + 2p	VIII
Daily exams	powerpoint	Sex chromosome abnormalities		٢n + 2p	Ninth
Daily exams	powerpoint	Sample collection, culture, and harvest		٢n + 2p	The tenth
Daily exams	powerpoint	Banding Techniques		٢n + 2p	eleventh
Daily exams	powerpoint	**Second exam**		٢n + 2p	twelve
Daily exams	powerpoint	Introduction to cytogenetics		٢n + 2p	Thirteenth
Daily exams	powerpoint	Heterochromatin, euchromatin, and the nucleosome		٢n + 2p	fourteenth
Daily exams	Spots	Chromosome replication, segregation, and the centrosome		٢n + 2p	Fifteenth

Course evaluation .١١

	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	Final exam / 34 marks	The theoretical part	
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part	

١٢. Learning and teaching resources

Required textbooks (methodology, if any)	. Introduction to cytogenetics Fundamentals of cytogenetics
Electronic references, Internet sites	

١. Course Name
Viruses and vaccines
٢. Course Code
٣. Semester/ year
Semester system / 2023-2024
٤. Date this description was prepared
٢٠٢٤/٢٢/٤
٥. A. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
٤ er week (2 hours theoretical part + 2 hours practical part) / number of units ٣
٧. Name of the course administrator (if more than one name is mentioned)
shahrazadah.kh@gmail.com :Ami - Name: Dr. Shahrazad Ahmad Khalaf Al
٨. objectives Course

ectives of the study subject	**tudy of viruses, their shapes , composition, and ways of replication* Study of virus classification* Study of viruses that infect the skin* Study of viruses that infect the respiratory system* Vaccines, their types and manufacturing methods***
٩. Teaching and learning strategies	
The strategy	**The graduate must be able to know and understand all of the following: ١. Knowing and understanding viruses, their structure, properties, and methods of replication. ٢. Understanding viruses that infect the skin. ٣. Understanding and knowing the viruses that infect the respiratory system. ٤. Study of vaccines, their types, methods of manufacturing, and their purpose.**

Course structure ١٠.					
Evaluation method	**Learning method**	**Name of the unit or topic**	**Required learning outcomes**	**hours**	**the week**
Daily exams	+ PowerPoint provides materials and materials for this	Viruses, structure and types	Viruses, their composition and types	٢n + 2p	the first
Daily exams	+ PowerPoint provides materials and materials for this	Viruses classification	Classification of viruses	٢n + 2p	the second
Daily exams	+ PowerPoint provides materials and materials for this	Replication of viruses	Viruses multiply	٢n + 2p	the third
Daily exams	+ PowerPoint provides materials and materials for this	Skin viral infections	Viruses that infect the skin	٢n + 2p	the fourth
Daily exams	Spots	Skin viral infections	Viruses that infect the skin	٢n + 2p	Fifth
Daily exams	+ PowerPoint provides materials and materials for this	Respiratory tract infection	Viruses that infect the respiratory system	٢n + 2p	VI
Daily exams	+ PowerPoint provides materials and materials for this	Exam.	Exam	٢n + 2p	Seventh
Daily exams	+ PowerPoint provides materials and materials for this	Respiratory tract infection	Viruses that infect the respiratory system	٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials and materials for this	GIT Viral Infections	Viruses that infect the intestinal system	٢n + 2p	Ninth
Daily exams	+ PowerPoint provides	Sexual transmit viruses	Sexually transmitted viruses	٢n + 2p	The tenth

	materials and materials for this				
Daily exams	+ PowerPoint provides materials and materials for this	Vaccine	Vaccines, their types and composition	٢n + 2p	eleventh
Daily exams	+ PowerPoint provides materials and materials for this	Methods of vaccine production	Methods of manufacturing vaccines and their purpose	٢n + 2p	twelve
		Exam.	Second semester exam	٢n + 2p	Thirteenth

١١. Course evaluation

	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	Final exam / 34 marks	The theoretical part
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part

١٢. Learning and teaching resources

	Required textbooks (methodology, if any)
	Main references (sources)
	Recommended supporting books and references (scientific journals, reports...)
	Electronic references, Internet sites

١. Course Name	
immunity	
٢. Course Code	
٣. Semester / year	
Semester system / 2023-2024	
٤. Date this description was prepared	
4/22/2024	
٥. Available attendance forms	
Is mandatory	
٦. Number of study hours (total)/number of units (total)	
r week (2 hours theoretical part + 2 hours practical part) / number of units 4 3 =	
٧. Name of the course administrator (if more than one name is mentioned)	
Al-Aymi to Zainab Abdel Muhammad .Name : M. Dr zainababed@uodiyala.edu.iq	
٨. Course objectives	
ectives of the study subject	repare students to acquire knowledge and understanding of the intellectual ١ framework, foundations and applications of biotechnology .And nano ,A-2 Prepare students to gain knowledge and understanding in industrial environmental, and food microbiology ,A-3 Prepare students to gain knowledge and understanding in genetics genetic engineering, and cytogenetics .And molecular biology ,A-4 Prepare students to gain knowledge and understanding of cell science botany, and plant and animal tissue And its applications ,A-5 Prepare students to gain knowledge and understanding of pathology .immunity, and pathogenic bacteria 6 Prepare students to acquire knowledge and understanding of life statistics .and the English language

٩. Teaching and learning strategies

The strategy	
	Provide students with the foundations and topics related to the knowledge and systems described in: ١- Clarification and explanation of study materials by faculty members through the use of the whiteboard displaying data, e-learning and, screens**LCD** PowerPoint using publishing video lectures On the YouTube channel. ٢- Providing students with knowledge through academic vocabulary homework assignments ٣- Asking students to visit the library to obtain academic knowledge related to academic vocabulary ٤- Improving students' skills by visiting websites to obtain additional knowledge of topics Scholarship ٥- Brainstorming during the lecture

١٠. Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
the first	٢n + 2p	Introduction, historical review development of immunology	Historical review, development of immunology	+ PowerPoint provides materials and materials for this	Daily exams
the second	٢n + 2p	Types of immunity	Natural immunity, mechanisms of natural resistance	+ PowerPoint provides materials and materials for this	Daily exams
the third	٢n + 2p	Components of the immune system	Inflammatory response, phagocytosis, acquired immunity, activity acquired immunity (Natural) and artificial	+ PowerPoint provides materials and materials for this	Daily exams

Daily exams	+ PowerPoint provides materials and materials for this	Characteristics, some other antigens (species specific, tissue specific, Forssman antigens CELLMEDIATE D IMMUNITY:	Antigens and Immunogens	٢n + 2p	the fourth
Daily exams	Spots	Exam.	Exam.	٢n + 2p	Fifth
Daily exams	+ PowerPoint provides materials and materials for this	General characteristics and properties Monoclonal antibodies important functions of. immunoglobulins	Antibodies	٢n + 2p	VI
Daily exams	+ PowerPoint provides materials and materials for this	Humoral immunity: introduction of the primary and the secondary response	Humoral. Immunity	٢n + 2p	Seventh
Daily exams	+ PowerPoint provides materials and materials for this	Cell-mediated immunity: introduction tests for evaluation of cell-mediated immunity	Cell-Mediated Immunity	٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials and materials for this	Lipid profile test Major histocompatibility complex Introduction class I mhc proteins Class ii mhc proteins biologic importance of mhc	Major Histocompatibility Complex	٢n + 2p	Ninth
Daily exams	+ PowerPoint provides materials and materials for this	Lipid profile test Complement: introduction activation of complement Biologic effects of complement pathways, mechanism of action according to type and function	Complement	٢n + 2p	The tenth

Daily exams	+ PowerPoint provides materials and materials for this	Exam	Exam	٢n + 2p	eleventh
Daily exams	+ PowerPoint provides materials and materials for this	Thyroid hormones test Hypersensitivity (allergy): introduction type i: immediate)(anaphylactic Hypersensitivity type ii: cytotoxic Hypersensitivity type iii: immune-complex hypersensitivity	Hypersensitivity	٢n + 2p	twelve
Daily exams	+ PowerPoint provides materials and materials for this	Nature of Antigen and Antibody reactions, Affinity, Avidity	Nature of Antigen and Antibody	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint provides materials and materials for this	Review previous lectures	Review previous lectures	٢n + 2p	fourteenth
Daily exams	Spots	Exam.	Semester exam.	٢n + 2p	Fifteenth

١١. Course evaluation

Pursuit score / 14 first semester exam marks marks for the second semester 14 exam grades daily exams 6	Final exam / 34 marks	The theoretical part
Pursuit grade / 6 first semester exam grade marks for the second semester 6 exam daily exam grades 4	Final exam /16 marks	practical part

Learning and teaching resources ١٢.	
Required textbooks (methodology, if any)	.Introduction to pathological analyses Basics of pathological analyses
Main references (sources)	A Manual of Laboratory and Diagnostic test 8th Edition 2009 Lippincott Williams & Wilkins
Recommended supporting books and references (…scientific journals, reports)	Molecular diagnostics ● Healthcare scientist ● Laboratory automation ● Automated analyzer ●
Electronic references, Internet sites	

١. Course Name
Microbiology genetics
٢. Course Code
٣. Semester/year
Semester system / 2023-2024
٤. Date this description was prepared
٢٠٢٤/٢٣/٤
٥. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
per week (2 hours theoretical part + 2 hours practical part) / number of units = 3 ٤
٧. Name of the course administrator (if more than one name is mentioned)
athmaradnan@uodiyala.edu.iq : Amel -Name: Lecturer Athmar Adnan Hakman Al

٨. objectives Course

ectives of the study subject	١. vering the concepts of microorganism inheritance and the difference from eukaryotic inheritance ٢. What is the genome and gene? ٣. thods of transferring genetic material between microorganisms by means of transformation, conjugation, and transmission ٤. Covering all types of mutations ٥. Study of vectors used among living organisms ٦. Knowledge of the genetic map of genetic organisms ٧. damage and repair mechanismsDNA

٩. Teaching and learning strategies

The strategy	:The graduate must be able to know and understand all of the following ١. The basic principles related to the scientific subject. ٢. Know and understand all types of mutations. repair mechanisms used in microbiologyDNA. ٤. Knowing and understanding how genetic traits develop in microorganisms.

١٠. Course structure

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
the first	٢n + 2p	Understanding the theoretical and practical principles and foundations related to the subject	Introduction in Genetic microbiology	+ PowerPoint seminars and video recording	Daily exams

Daily exams	+ PowerPoint provides materials and materials for this	Definition of genetics and genome	Understanding the theoretical and practical principles and foundations related to the subject	٢n + 2p	the second
Daily exams	+ PowerPoint material availability Specific to that	Horizontal gene transfer	Understanding the mechanisms of transfer of genetic material between microorganisms	٢n + 2p	the third
Daily exams	+ PowerPoint availability of materials for this	Transformation	Explain the mechanism of transfer of genetic material by transformation	٢n + 2p	the fourth
Daily exams	Spots	Exam.	First semester exam	٢n + 2p	Fifth
Daily exams	+ PowerPoint availability of materials for this	Conjugation	Conjugation transfer test	٢n + 2p	VI
Daily exams	+ PowerPoint availability of materials for this	Transduction	Testing the transfer of genetic material between phages and bacteria	٢n + 2p	Seventh
Daily exams	+ PowerPoint video and seminars	Genetic vector	Understanding and knowing the types of vectors used between microorganisms to transfer genetic material	٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials for this	Mutation	Testing for mutations in bacteria	٢n + 2p	Ninth
Daily exams	+ PowerPoint video and seminars	Gene mapping	Knowledge and understanding of genetic mapping	٢n + 2p	The tenth
Daily exams	+ PowerPoint video and seminars	Regulation of gene expression in prokaryotic	Mechanisms of gene expression in prokaryotes	٢n + 2p	eleventh
Daily exams	+ PowerPoint video and seminars	DNA repair in prokaryotic	Understanding repair mechanisms in bacteria	٢n + 2p	twelve
Daily exams	+ PowerPoint video and seminars	Transposition of DNA	Understand the properties and effects of conveying elements	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint video and seminars	Types of clones	,Knowledge of clona its importance and applications	٢n + 2p	fourteenth
Daily exams	Spots	Exam.	Second semester exam	٢n + 2p	fourteenth
Course evaluation .١١					

	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	Final exam / 34 marks	The theoretical part	
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part	

١٢. Learning and teaching resources

Required textbooks (methodology, if any)	udhari, K. (2014). Microbial Genetics. The Energy and Resources Institute (TERI).
Main references (sources)	Nakatsu, C. H. (2021). Microbial genetics. In Principles and Applications of Soil Microbiology (pp. 89-109). Elsevier
Recommended supporting books and references (scientific journals, reports...)	Text books Scientific journals Letters and theses
Electronic references, Internet sites	https://www.nature.com/subjects/microbal–genetics

fourth stage

١. Course Name
Satisfactory analyzes
٢. Course Code
٣. Semester/ year
Semester system / 2023-2024
٤. Date this description was prepared
٢٠٢٤/٢٢/٤
٥. A. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
٤ ber week (2 hours theoretical part + 2 hours practical part) / number of units ٣
٧. Name of the course administrator (if more than one name is mentioned)
shahrazadah.kh@gmail.com :Ami - Name: Dr. Shahrazad Ahmad Khalaf Al
٨. objectives Course

ectives of the study subject	**Clarifying the basic principles of pathological analyses* .Explaining the methods and types of collecting pathological samples* Study of serological analyses* .Study of culture analyzes and sensitivity tests* .Study of chemical and hormonal analyses***
٩. Teaching and learning strategies	
The strategy	**The graduate must be able to know and understand all of the following: ١. The basic principles of methods for all pathological samples ٢. Know and understand all types of serological tests and their purpose. ٣. Knowing and understanding all culture analyzes for different samples ٤. Knowing and understanding all chemical and hormonal analyses.**

١٠. Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week

Daily exams	+ PowerPoint provides materials and materials for this	Collecting Samples for Laboratory Testing	Basics of laboratory work Methods of collecting pathological samples	٢n + 2p	the first
Daily exams	+ PowerPoint provides materials and materials for this	GUE, GSE	General administration general, examination exit examination	٢n + 2p	the second
Daily exams	+ PowerPoint provides materials and materials for this	Culture unit	Cultivation of microorganisms from various pathological samples	٢n + 2p	the third
Daily exams	+ PowerPoint provides materials and materials for this	AST	Antibiotic susceptibility testing	٢n + 2p	the fourth
Daily exams	Spots	Exam.	First semester exam	٢n + 2p	Fifth
Daily exams	+ PowerPoint provides materials and materials for this	CBC	Polycythemia test	٢n + 2p	VI
Daily exams	+ PowerPoint provides materials and materials for this	Live function test	Liver function tests	٢n + 2p	Seventh
Daily exams	+ PowerPoint provides materials and materials for this	Renal function test	Kidney function tests	٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials and materials for this	Lipid profile test	Blood fat tests	٢n + 2p	Ninth
Daily exams	+ PowerPoint provides materials and materials for this	Lipid profile test	Blood fat tests	٢n + 2p	The tenth
Daily exams	+ PowerPoint provides materials and	Sugar test	Sugar test	٢n + 2p	eleventh

	materials for this				
Daily exams	+ PowerPoint provides materials and materials for this	Thyroid hormones test	Thyroid hormone tests	٢n + 2p	twelve
Daily exams	+ PowerPoint provides materials and materials for this	Sexual hormones test	Sex hormone tests	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint provides materials and materials for this	HBA1c	Cumulative sugar	٢n + 2p	fourteenth
Daily exams	Spots	Exam.	Second semester exam	٢n + 2p	Fifteenth

١١. Course evaluation

	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	Final exam / 34 marks	The theoretical part
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part

١٢. Learning and teaching resources

.Introduction to pathological analyses Basics of pathological analyses	Required textbooks (methodology, if any)
A Manual of Laboratory and Diagnostic test 8th Edition 2009 Lippincott Williams & Wilkins	Main references (sources)
●Molecular diagnostics ●Healthcare scientist ●Laboratory automation ●Automated analyzer	Recommended supporting books and references (scientific journals, reports...)
	Electronic references, Internet sites

١. Course Name	
Cytogenetics	
٢. Course Code	
٣. Semester/ year	
Semester system / 2023-2024	
٤. Date this description was prepared	
٤/٢٨/٢٠٢٤	
٥. A. Available attendance forms	
Is mandatory	
٦. Number of study hours (total)/number of units (total)	
٤ er week (2 hours theoretical part + 2 hours practical part) / number of units ٣	
٧. Name of the course administrator (if more than one name is mentioned)	
naseerkhalel@oudiyala.edu.iq :Amel - Name: Prof. Nasir Khalil Obaid Al	
٨. objectives Course	
ectives of the study subject	١- Covering the basics of molecular biology of eukaryotic and prokaryotic organisms . ٢ - A complete understanding of how the cells of living organisms work at the molecular level. ٣ - e possibility of using modern applications of molecular life science to develop various pharmaceutical and medical industries.
٩. Teaching and learning strategies	
The strategy	A1- The theoretical principles and foundations related to the scientific subject of cognitive sciences A2- The foundations of scientific research, methods of measurement, analysis, and finding solutions to scientific problems A3- The importance of theoretical scientific aspects related to the applications of various sciences A4- Scientific and linguistic terms and their definition of various scientific subjects

A5- Methods related to analyzing and designing scientific experiments for various scientific subjects	

Course structure .١٠

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	powerpoint	Introduction to cytogenetics		٢n + 2p	the first
Daily exams	powerpoint	Heterochromatin, euchromatin, and the nucleosome		٢n + 2p	the second
Daily exams	powerpoint	Chromosome replication, segregation, and the centrosome		٢n + 2p	the third
Daily exams	powerpoint	Numerical Abnormalities		٢n + 2p	the fourth
Daily exams	powerpoint	Structural Chromosome Abnormalities		٢n + 2p	Fifth
Daily exams	powerpoint	First exam		٢n + 2p	VI
Daily exams	powerpoint	Mechanisms of structural abnormalities		٢n + 2p	Seventh
Daily exams	powerpoint	Sex chromosomes, X chromosome inactivation		٢n + 2p	VIII
Daily exams	powerpoint	Sex chromosome abnormalities		٢n + 2p	Ninth
Daily exams	powerpoint	Sample collection, culture, and harvest		٢n + 2p	The tenth
Daily exams	powerpoint	Banding Techniques		٢n + 2p	eleventh
Daily exams	powerpoint	**Second exam**		٢n + 2p	twelve
Daily exams	powerpoint	Introduction to cytogenetics		٢n + 2p	Thirteenth
Daily exams	powerpoint	Heterochromatin, euchromatin, and the nucleosome		٢n + 2p	fourteenth
Daily exams	Spots	Chromosome replication, segregation, and the centrosome		٢n + 2p	Fifteenth

Course evaluation .١١

	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	Final exam / 34 marks	The theoretical part	
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part	

١٢. Learning and teaching resources

Required textbooks (methodology, if any)	. Introduction to cytogenetics Fundamentals of cytogenetics
Electronic references, Internet sites	

١. Course Name
Food microbiology
٢. Course Code
٣. Semester/year
Semester system / 2023-2024
٤. Date this description was prepared
٢٠٢٤/٤/٢2
٥. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
per week (2 hours theoretical part + 2 hours practical part) / number of units = 3 ٤
٧. Name of the course administrator (if more than one name is mentioned)
Dr . M .Name: A Amel Zainab Amer Hatem Al : zainabamer@uodiyala.edu.iq
٨. objectives Course

١. Introducing the student to the important types of food microorganisms (used in food industries) and the harmful ones that cause (food spoilage), in addition to effective methods to inhibit or kill harmful bacteria and thus protect food from spoilage. This course is considered an important tool for studying life sciences and biotechnology, through which the student gets to know How to isolate and diagnose bacteria and study the effect of physical and chemical environmental factors on the vitality of microbes. This course also sheds light on contaminated pathogenic microorganisms.	ectives of the study subject

٩. Teaching and learning strategies	
:The graduate must be able to know and understand all of the following ١- Introducing the student to harmful food microorganisms ٢- Introducing the student to effective and effective methods to inhibit or kill bacteria and thus protect food from spoilage ٣- Isolating and identifying these bacteria and studying the effect of physical and chemical factors on the vitality of microbes ٤- Shedding light on pathogenic food microorganisms contaminating food	The strategy

١٠. Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	The style of lectures and seminars	Introduction to Food Microbiology	Understanding the important	٢n + 2p	the first

			theoretical and practical principles and fundamentals related to the subject		
=	=	Important Microorganisms in food	=	٢n + 2p	the second
=	=	**Intrinsic and Extrinsic Parameters of Food Effecting on Microbial Growth**	=	٢n + 2p	the third
Daily exams	=	Food Spoilage and Preservation	Understanding the important theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the fourth
Daily exams	=	**Food Preservation by High-Temperature**	=	٢n + 2p	Fifth
The student's grade on the exam is in addition to the daily exam average	Test hall for the theoretical exam and spots for the practical part	First exam	First exam	٢n + 2p	VI
Daily exams	The style of lectures and seminars	Preservation of Foods by Radiation	Understanding the important theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Seventh
Daily exams	=	Preservation of Foods with Antimicrobials	=	٢n + 2p	VIII
Daily exams	=	Spoilage of Specific Food Groups: milk	=	٢n + 2p	Ninth
Daily exams	=	Spoilage of Specific Food Groups: meat	=	٢n + 2p	The tenth
Daily exams	=	Microbial Enzymes	=	٢n + 2p	eleventh
Daily exams	=	Enzymes in food processing	=	٢n + 2p	twelve
Daily exams	=	Food borne diseases and intoxications	=	٢n + 2p	Thirteenth
The student's grade on the exam is in addition to the daily exam average	Test hall for the theoretical exam and spots for the practical part	**Second exam**	Second exam	٢n + 2p	fourteenth
The student's score on the exam	Test hall for the theoretical exam and	Final exam.	End of course exam	٢n + 2p	Fifteenth

	spots for the practical part				

١١. Course evaluation

	marks for first15 /Pursuit score semester exam marks for the15 second semester exam daily exam grades4	Final exam / 34 marks	The theoretical part	
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part	

١٢. Learning and teaching resources

. Food Microbiology. Fundamentals and Frontiers. M. P. Doyle, L. R. Beuchat and T. J. Montville, eds., ASM Press, Washington, DC. 1997 (or 2001). ١.	equired textbooks (methodology, if any)
1. Modern Food Microbiology. Seventh Edition. JM Jay. Aspen Publishers, Inc., Gaithersburg, Maryland 2005. 3. Food Microbiology: An Introduction. TJ Montville and KR Matthews (any edition) ASM Press, Washington, DC.2005	Main references (sources)
journal of food safety.2 journal of food protection.3 journal of food science	Recommended supporting books and ,references (scientific journals (...reports
//www.ift.org/knowledgescience.aspx-food-about -https://www.teilar.gr/dbData/ProfAnn/profann1de51c7a.pdf	Electronic references, Internet sites

١. Course Name
Satisfactory analyzes
٢. Course Code
٣. Semester/ year
Semester system / 2023-2024
٤. Date this description was prepared
٢٠٢٤/٢٢/٤
٥. A. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
٤ er week (2 hours theoretical part + 2 hours practical part) / number of units ٣
٧. Name of the course administrator (if more than one name is mentioned)
Amil- Name: A M. Composed by Muhammad Alwan Al alhanalwan@gmail.com
٨. objectives Course

ectives of the study subject	**Explaining the basic principles of tissue culture* . Clarification of methods for establishing a tissue culture laboratory* Study of types of plant hormones* Study of types of sterilizers* .Study of chemical and hormonal analyses***
٩. Teaching and learning strategies	
The strategy	**The graduate must be able to know and understand all of the following: ١. The basic principles of laboratory establishment methods ٢. Knowing and understanding all types of analyzes and plant hormones. ٣. Knowing and understanding all laboratory sterilization methods. ٤. Knowing and understanding all chemical and hormonal analyses.**
١٠. Course structure	

the week	hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method

Daily exams	+ PowerPoint provides materials and materials for this	Collecting Samples for Laboratory Testing	Basics of laboratory work Sample collection methods	٢n + 2p	the first
Daily exams	+ PowerPoint provides materials and materials for this	Basic concepts of plant tissue culter	Basic principles of plant tissue culture	٢n + 2p	the second
Daily exams	+ PowerPoint provides materials and materials for this	Plant tissue culture application	Tissue culture applications	٢n + 2p	the third
Daily exams	+ PowerPoint provides materials and materials for this	Type of plant hormones	Types of plant hormones	٢n + 2p	the fourth
Daily exams	Spots	Exam.	First semester exam	٢n + 2p	Fifth
Daily exams	+ PowerPoint provides materials and materials for this	Culture media	Agricultural circles	٢n + 2p	VI
Daily exams	+ PowerPoint provides materials and materials for this	Functions of culture media	Agricultural jobs	٢n + 2p	Seventh
Daily exams	+ PowerPoint provides materials and materials for this	Essential elements for plant growth	Essential elements for plant growth	٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials and materials for this	Preparation of media	Preparing the culture medium	٢n + 2p	Ninth
Daily exams	+ PowerPoint provides materials and materials for this	Sterilization	Sterilization	٢n + 2p	The tenth
Daily exams	+ PowerPoint provides materials and	Physical methods	Physical methods of sterilization	٢n + 2p	eleventh

	materials for this				
Daily exams	+ PowerPoint provides materials and materials for this	Callus culture	Callus cultivation	٢n + 2p	twelve
Daily exams	+ PowerPoint provides materials and materials for this	**Isolation and culture of protoplast**	Separation and cultivation of protoplasts	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint provides materials and materials for this	Micropropation	Accurate multiplication	٢n + 2p	fourteenth
Daily exams	Spots	Exam.	Second semester exam	٢n + 2p	Fifteenth

١١. Course evaluation

Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	Final exam / 34 marks	The theoretical part
Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part

١٢. Learning and teaching resources

book on plant tissue culture by author Kazem Al-Sumaidaie	Required textbooks (methodology, if any)
The book on plant tissue culture by Tariq Kabil	Main references (sources)
● ●	Recommended supporting books and references (scientific journals, reports...)
	Electronic references, Internet sites

١. Course Name	
Enzymes	
٢. Course Code	
٣. Semester/ year	
Semester system / 2023-2024	
٤. Date this description was prepared	
٤/٢٢/٢٠٢٤	
٥. A. Available attendance forms	
Is mandatory	
٦. Number of study hours (total)/number of units (total)	
٤ er week (2 hours theoretical part + 2 hours practical part) / number of units ٣	
٧. Name of the course administrator (if more than one name is mentioned)	
zeyadkh.radeef@uodiyala.edu.iq:Amiel - Name: Dr. Ziad Khallouf Radif Al	
٨. objectives Course	
ectives of the study subject	**e chemical reactions that keep us alive – metabolic reactions – depend narily on enzymes. Enzymes catalyze chemical reactions, and in some es they can make a reaction a million times faster than it would be .without the catalyst**
٩. Teaching and learning strategies	
The strategy	Introduction to the science of enzymes, the concepts of their functions, the variables that occur in them, and their impact on living .organisms in general and humans in particular

١٠. Course structure

the week	hours	Required learning outcomes	Learning method	Evaluation method
the first	٢n + 2p	Introduction to enzymes	+ PowerPoint provides materials and	Daily exams

	materials for this			
Daily exams	+ PowerPoint provides materials and materials for this	Enzyme structure	٢n + 2p	the second
Daily exams	+ PowerPoint provides materials and materials for this	Enzymatic catalysis	٢n + 2p	the third
Daily exams	+ PowerPoint provides materials and materials for this	Enzyme inhibition	٢n + 2p	the fourth
Daily exams	Spots	Enzyme regulation	٢n + 2p	Fifth
Daily exams	+ PowerPoint provides materials and materials for this	Enzyme kinetics	٢n + 2p	VI
Daily exams	+ PowerPoint provides materials and materials for this	Coenzymes and cofactors	٢n + 2p	Seventh
Daily exams	+ PowerPoint provides materials and materials for this	Enzyme immobilization	٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials and materials for this	Enzyme engineering	٢n + 2p	Ninth
Daily exams	+ PowerPoint provides materials and materials for this	Enzymes in medicine	٢n + 2p	The tenth
Daily exams	+ PowerPoint provides materials and materials for this	Enzymes in biotechnology	٢n + 2p	eleventh

Daily exams	+ PowerPoint provides materials and materials for this	Enzymes in agriculture	٢n + 2p	twelve
Daily exams	+ PowerPoint provides materials and materials for this	Enzymes in environmental sciences	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint provides materials and materials for this	Emerging trends in enzymology	٢n + 2p	fourteenth
Daily exams	Spots	Ethical and societal implications of enzyme technology	٢n + 2p	Fifteenth

١١. Course evaluation

The theoretical part	Final exam / 34 marks	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	
practical part	Final exam/16 marks	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	

١٢. Learning and teaching resources

Required textbooks (methodology, if any)	
Main references (sources)	
Recommended supporting books and references (scientific journals, reports...)	
Electronic references, Internet sites	

Course description

١. Course Name
Industrial microbiology
٢. Course Code
٣. Semester/year
Semester system / 2023-2024
٤. Date this description was prepared
4/30/2024
٥. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
٤ per week (2 hours theoretical part + 2 hours practical part) / number of units = 3
٧. Name of the course administrator (if more than one name is mentioned)
A .Name: Dr.. Hala Muhammad Hussein. M :tend to n't I do h alahalhasani@gmail.com
٨. objectives Course

ectives of the study subject	١. Introducing the student to industrial microorganisms and focusing on the important species involved in the manufacture of various products such as food products, enzymes, organic acids, amino acids, antibiotics and vaccines. ٢. Introducing the student to the optimal methods for producing these materials industrially using natural and genetically modified microorganisms for the purpose of increasing and improving production. ٣. Introducing the student to the products of primary and secondary metabolism of microorganisms, which are closely related to the products above. ٤. Introducing the student to the different types of fermentations that play an essential role in production.
٩. Teaching and learning strategies	
The strategy	:The graduate must be able to know and understand all of the following • Phenotypic and microscopic diagnosis of industrial microorganisms. • Distinguish between pathogenic and beneficial bacteria for humans. • Commitment to the conditions of work in the microbiology laboratory in general and industrial microbiology in particular. • How to isolate bacteria and identify beneficial bacteria that are used for industrial purposes from soil and other natural sources.

• General basic methods for producing foodstuffs and pharmaceuticals important to humans and isolating and purifying them from beneficial bacteria.	

Course structure .١٠

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams	+ PowerPoint provides materials and materials for this	**Introduction: Scope of Biotechnology and Industrial Microbiology** **Overview on microbial growth and metabolite production.**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the first
Daily exams	+ PowerPoint provides materials and materials for this	**Fermentation technology and downstream processing. Types of fermenters**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the second
Daily exams	+ PowerPoint provides materials and materials for this	**Some Microorganisms Commonly Used in Industrial Microbiology and Biotechnology**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the third
Daily exams	+ PowerPoint provides materials and materials for this	**Screening for Productive Strains and Strain Improvement in Biotechnological Organisms**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the fourth
Daily exams	+ PowerPoint provides materials and materials for this	**Metabolic Pathways for the Biosynthesis of Industrial Microbiology Products**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Fifth
Daily exams	+ PowerPoint provides materials and materials for this	**Production of Microbial enzymes**	Understanding the theoretical and practical principles and	٢n + 2p	VI

			fundamentals related to the subject		
Daily exams	+ PowerPoint provides materials and materials for this	**Production of Acetic Acids , Organic Acids and Industrial Alcohol**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Seventh
The student's score on the exam	Test hall for the theoretical exam and spots for the practical part	**First Mid-term Exam.**		٢n + 2p	VIII
Daily exams	+ PowerPoint provides materials and materials for this	**Single Cell Protein (SCP)**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Ninth
Daily exams	+ PowerPoint availability of materials for this	**Yeast Production** **Production of Baker's Yes, Production of food yeast**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	The tenth
Daily exams	+ PowerPoint provides materials and materials for this	**Production of Fermented Foods**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	eleventh
Daily exams	+ PowerPoint availability of materials for this	**Production of Antibiotics**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	twelve
Daily exams	+ PowerPoint availability of materials for this	**Production of Vaccines**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Thirteenth

Daily exams	+ PowerPoint availability of materials for this	**Fuels and industrial chemicals**	Understanding the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	fourteenth
The student's score on the exam	Test hall for the theoretical exam and spots for the practical part	**Second Mid-term Exam**		٢n + 2p	Fifteenth

١١. Course evaluation

	marks for first15 /Pursuit score semester exam marks for the15 second semester exam daily exam grades4	Final exam / 34 marks	The theoretical part	
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part	

١٢. Learning and teaching resources

quired textbooks (methodology, if any)	
Main references (sources)	• Okafor, N. (2016). Modern industrial microbiology and biotechnology. CRC Press. • Skovgaard, N. (2002). Industrial Microbiology: An Introduction-Michael J. Waites, Neil L. Morgan, John S. Rockey, Gary Higton (Eds.); Blackwell Science, Oxford, UK.
Recommended supporting books and ,references (scientific journals (...reports	Text books Scientific journals Letters and theses
Electronic references, Internet sites	International network for information on the subject of the course

١. Course Name
Plant chemistry
٢. Course Code
٣. Semester/ year
Semester system / 2023-2024
٤. Date this description was prepared
٢٠٢٤/١٥/١
٥. A. Available attendance forms
Is mandatory
٦. Number of study hours (total)/number of units (total)
ber week (2 hours theoretical part + 2 hours practical part) / number of units ٤ ٣
٧. Name of the course administrator (if more than one name is mentioned)
nail , Name: A. Prof. Dr. Shaymaa Hatem Al-Majjami shaymaa@uodiyala.edu.iq
٨. objectives Course

ectives of the study subject	• Students will learn about the different chemical compounds found in it the plants. • -Students must have the ability to explain the importance of The by products found in plants. • The student will learn how to classify plants based on the chemical compounds present. • Students will learn that plants can effectively boost and help the body's immune system In healing from various diseases. • t is necessary to have a good understanding of poisonous plants and be familiar with their basic concepts .

٩. Teaching and learning strategies	
The strategy	❖ **Introduce new material using small steps** ❖ **Support students in developing a growth mindset using many of the strategies already outlined – modeling, chunking, checking for understanding, questioning and collaborative learning to name a few.** ❖ **Check students' understanding using reports and exams**

Course structure ١٠					
Evaluation method	**Learning method**	**Name of the unit or topic**	**Required learning outcomes**	**hours**	**the week**
Daily exams	+ PowerPoint seminars	Introduction and overview	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the first
Daily exams	+ PowerPoint seminars	History of use of plants to cure diseases	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the second
Daily exams	+ PowerPoint seminars	History of use of plants to cure diseases	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the third
Daily exams	+ PowerPoint seminars	Therapeutic uses of plants	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	the fourth
Daily exams	+ PowerPoint seminars	Pharmacognosy, ethnopharmacology, and chemistry of medicinal plants	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Fifth
Daily exams	+ PowerPoint seminars	Psychoactive plants	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	VI

Daily exams	+ PowerPoint seminars	Ailments caused by some plants to humans and animals	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Seventh
Daily exams	+ PowerPoint seminars	Beneficial effects of some food plants	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	VIII
Daily exams	+ PowerPoint seminars	Contribution of medicinal plants to alternative and modern medicine	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Ninth
Daily exams	+ PowerPoint seminars	First exam	the first exam	٢n + 2p	The tenth
Daily exams	+ PowerPoint seminars	Medicinal Plants of the American and Mexican West	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	eleventh
Daily exams	+ PowerPoint seminars	Plant investigation methods	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	twelve
Daily exams	+ PowerPoint seminars	An overview of Structural identification methods	Understand the theoretical and practical principles and fundamentals related to the subject	٢n + 2p	Thirteenth
Daily exams	+ PowerPoint seminars	Secondary metabolism	Understand the theoretical and practical principles and fundamentals	٢n + 2p	fourteenth

			related to the subject		
Daily exams		Second exam	Second exam	٢n + 2p	Fifteenth

١١. Course evaluation

	Pursuit score / 14 first semester exam marks marks for the second semester ١٤ exam grades daily exams ٦	Final exam / 34 marks	The theoretical part
	Pursuit grade / 6 first semester exam grade marks for the second semester ٦ exam daily exam grades ٤	Final exam/16 marks	practical part

١٢. Learning and teaching resources

edicinal Plants: Chemistry and Properties 1st Edition by M Daniel	Required textbooks (methodology, if any)
Textbook of Plant Chemistry, 2011	Main references (sources)
Nature journals Natural product chemistry	Recommended supporting books and references (scientific journals, reports...)
Research gate	Electronic references, Internet sites